DOCUMENT RESUME

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ABSTRACT

Developed by classroom teachers during the development phase of Minnesota's Graduation Standards, this performance package is made up of locally designed assignments that, taken together, show whether a student has learned and can apply the knowledge and skills related to technical reading regarding small engines. It begins with reference to the particular content standard addressed in the package (read and apply technical information from a variety of English language documents or electronic media), the educational level of the package (high school), and a summary statement of the content standard. It then describes the tasks associated with the student performances: (1) use specialized vocabulary and apply information from technical resources; and (2) disassemble and reassemble a large industrial 2- or 4-cycle engine. It then offers specific statements from the standard regarding what students should know and should do, the products, task description, special notes, and feedback checklists for each task enumerated in the package. (RS)

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ED 460 388

MINNESOTA DEPARTMENT OF CHILDREN, FAMILIES AND LEARNING
Performance Package
Minnesota Profile of Learning

Content Standard: Read, View, Listen: Technical Reading **Level:** High School

Title of Package/Activity: Tech Reading/Small Engines

Summary Statement of Content Standard:

Read and apply technical information from a variety of English language documents or electronic media.

Description of Student Performances:

Task 1: Use specialized vocabulary and apply information from technical resources.

Task 2: Disassemble and reassemble a large industrial 2- or 4-cycle engine from plans and guidelines in technical manuals. Set up, adjust, calibrate, and maintain service equipment used to service, machine, or maintain engine components.

FINAL ACHIEVEMENT: Use the following scoring criteria when evaluating student performance.

Scoring Criteria
4 - Performance on this standard achieves and exceeds expectations of high standard work.
3 - Performance on this standard meets the expectations of high standard work.
2 - Work on this standard has been completed, but all or part of the student's performance is below high standard level.
1 - Work on this standard has been completed, but performance is substantially below high standard level.
No package score is recorded until ALL parts of the package have been completed

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CS 216 752

PERFORMANCE PACKAGE TASK 1
Tech Reading/Small Engines

Content Standard: Read, View, Listen: Technical Reading **Level:** High School

Specific Statement(s) from the Standard:

What students should do:

2. Identify and select relevant information for the given need
3. Interpret specialized vocabulary

In addition:

1. Teacher will provide technical documents such as:
   a. code books
   b. plat books
   c. manuals
   d. maps
   e. government regulations
   f. nutrition standards
   g. product plans
   h. environmental impact statement

Product(s):

- Lab activity sheets
- Student-teacher conferences

Task Description:

You must use and interpret information from technical manuals during your work in the automotive shop. Your teacher will check your work periodically (as frequently as daily) to monitor your progress, and you must be prepared to discuss the work using specialized technical vocabulary.

A. Accurately locate information on a large industrial 2- or 4-cycle engine from technical manuals and record it on lab activity sheets. Record the following:

   1. the engine identification (make and model)
   2. bore, stroke, and displacement
   3. ignition system(s) service
   4. engine block service
   5. valve train service, if applicable
   6. power producing components (piston, rings, rod, and crank shaft)
   7. fuel delivery systems.

B. Referring to the technical manual, answer your teacher's questions during progress checks about 1) the technical specifications of the engine and its parts, and 2) the order of assembly/disassembly or location of parts using appropriate diagrams.

Special Notes:

- Lab activity sheets are step-by-step guides developed by the teacher to lead students through shop procedures.
- Teachers may provide a variety of methods for students to record their work (written work reports or detailed lab activity sheets are examples).
- Examples of appropriate engines include, but are not limited to, garden tractors, motorcycle engines, outboard motors, snowmobiles, and large generator engines.

(Special thanks to Frank Becker from Champlin Park High School for his initial contribution.)

PERFORMANCE PACKAGE TASK 1
Tech Reading/Small Engines

FEEDBACK CHECKLIST FOR TASK 1

The purpose of the checklist is to provide feedback to the student about his/her work relative to the content standard. Have the standard available for reference.

Y=Yes
N=Needs Improvement

Student		Teacher
_____	Appropriate and accurate technical vocabulary is used correctly.	_____
_____	All necessary and accurate information from technical manuals and resources is selected and applied.	_____
_____	Information from technical manuals on charts and tables is accessed and used accurately.	_____
_____	Multiple sources of information are accessed to acquire information, when necessary.	_____

Overall Comments: (information about student progress, quality of the work, next steps for teacher and student, needed adjustments in the teaching and learning processes, and problems to be addressed):

PERFORMANCE PACKAGE TASK 2
Tech Reading/Small Engines

Content Standard: Read, View, Listen: Technical Reading **Level:** High School

Specific Statement(s) from the Standard:

What students should do:

1. Apply information from a technical reading, viewing or listening selection in at least two of the following applications:
   a. build or assemble from a plan
   b. operate, maintain, or repair from a technical manual
   c. analyze a situation based on technical information
   d. create a design based on technical reading
2. Identify and select relevant information for the given need
3. Interpret specialized vocabulary
4. Interpret information found in charts, graphs, tables, and other visual/graphic representations of data
5. Apply step-by-step procedures

Product(s):

- A completely disassembled and reassembled engine to factory specifications that will start and run consistently
- Student-teacher conferences

Task Description:

While disassembling and reassembling a large industrial 2- or 4-cycle engine, use technical information from your lab activity sheets (Task 1) and technical manuals to complete the following steps:

1. Disassemble and clean engine parts.
2. Visually inspect the condition of parts and record results.
3. Determine whether or not parts need replacing, based on one or more of the following methods:
   a. gross visual damage
   b. precision measurement assessment
   c. determining if the machining required is beyond repairable limits.
4. Prior to completing the machining in step 10, it is important to maintain and adjust the equipment and tools you will need. Refer to technical manuals and resources to complete steps 5 through 9. In progress checks, you will answer your teacher's questions about your work, referencing the technical manuals. **All adjustments and calibration must be verified by teacher before proceeding.**
5. Calibrate, if necessary, one or more of the following to measure cylinder taper:
   a. inside or outside micrometer
   b. cylinder taper gauges.
6. Set up cylinder boring equipment, if available.
7. Select and adjust appropriate piston servicing equipment to include ring groove cleaner and feeler gauges.

Task Description, continued

8. Select, adjust, and calibrate the following: small hole gauges, telescopic gauges, inside and outside micrometers, plastic gauge, and dial indicators to accurately service the engine block connecting rods, camshafts, and crankshaft.

9. Correctly maintain and adjust poppet valve equipment to properly service valve components. This should include properly dressing the grinding stone face and selecting and adjusting the proper angles.

10. Machine or replace parts as needed.

11. Reassemble engine components/systems, making allowances for tolerances, according to information from technical manuals.

12. Service engine with proper lubricants to appropriate specifications.

13. Start engine.

14. If the engine fails to start or engine starts but will not restart, you must determine possible problems and solutions (e.g., no spark, no fuel, mechanical failure). If available, use technical manuals for locating the step-by-step procedures and/or trouble-shooting flow charts to assist you in solving the engine's problem.

PERFORMANCE PACKAGE TASK 2
Tech Reading/Small Engines

FEEDBACK CHECKLIST FOR TASK 2

The purpose of the checklist is to provide feedback to the student about his/her work relative to the content standard. Have the standard available for reference.

Y=Yes
N=Needs Improvement

Student		Teacher
	Engine	
_____	Engine is disassembled using a systematic method, based on specifications from technical manuals and resources.	_____
_____	Engine components are adjusted, machined, or replaced, based on allowable tolerances, as indicated in technical manuals.	_____
_____	Engine components are reassembled using systematic method, allowing for required tolerances.	_____
_____	Step-by-step troubleshooting procedures are applied appropriately and correctly, as indicated in technical manuals and resources.	_____
_____	Final engine assembly is properly serviced with the recommended lubricants and fuel.	_____
	Service Equipment	
_____	Technical manuals and other necessary sources are used appropriately and effectively to set up, calibrate, adjust, or maintain specialized service equipment and tools.	_____
_____	Specialized service equipment is accurately maintained.	_____
_____	Specialized service equipment is properly adjusted.	_____
_____	Calibration of precision measuring equipment meets industry specifications.	_____

Overall Comments: (information about student progress, quality of the work, next steps for teacher and student, needed adjustments in the teaching and learning processes, and problems to be addressed):